were used to compare these phenotypes on clinical outcomes (i.e. pain and activity limitations), taking into account possible confounders.
Results: Five phenotypes of knee OA patients were identified: 'strong muscle phenotype', 'non-obese and weak muscle phenotype', 'obese and weak muscle phenotype', 'depressive phenotype' and 'risk factor neutral phenotype'. The 'depressive phenotype' showed highest pain levels, while both the 'depressive phenotype' and 'obese and weak muscle phenotype' showed relatively severe activity limitations.
Conclusions: Five phenotypes based on clinically relevant patient characteristics can be identified in the heterogeneous population of knee OA patients. These phenotypes were dissimilar on clinical outcomes. Interventions may need to be tailored to these phenotypes.

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INFLUENCE OF DETERMINANTS ON THE DEVELOPMENT OF OSTEOARTHRITIS IN PATIENTS WITH AN ANTERIOR CRUCIATE LIGAMENT INJURY: A SYSTEMATIC REVIEW

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Purpose: Previous studies showed that an anterior cruciate ligament (ACL) injury is an important risk factor for the development of osteoarthritis (OA). Not all patients with an ACL injury will develop OA at the long-term. To identify patients with an ACL injury with an increased risk for the development of OA, knowledge concerning potential determinants is necessary. Therefore we conducted a systematic review to identify these determinants.
The aim of this study was to summarize the evidence of determinants influencing the risk of OA in patients with an ACL injury.
Methods: The Medline, Embase, Web of Science and Cinahl medical literature databases were searched up to April 2011. Search terms included anterior cruciate ligament, synonyms for injury, etiology, causality, determinant, variable and synonyms for osteoarthritis. Two reviewers (BvM, MR) independently selected the studies. Studies evaluating the influence of determinants on the development of OA in patients with an ACL injury were included. Two reviewers (BvM, MR) extracted the data and two reviewers (DM, SBZ) independently conducted the quality assessment.
Results: Twenty-six out of 612 studies met the inclusion criteria and were included in this systematic review. The included studies had the following designs: randomized controlled trial (n = 1), prospective follow-up study (n = 5), retrospective study (n = 18) and cross-sectional study (n = 2). The numbers of patients available for follow-up measurement in the studies ranged from 23 to 564. Patients in the included studies received different treatment strategies for their ACL injury. In 17 studies all patients had a reconstructed ACL, in 4 studies the population consisted of both patients with an ACL reconstruction and patients treated conservatively and in 5 studies all patients were treated conservatively. In 24 studies the OA outcome was determined with radiographs, in the other two studies MRI assessment or arthroscopic findings were used as grading system for OA outcome. The mean follow-up time in the studies ranged from 4 to 18 years. Because of heterogeneity of the included studies (OA outcome and determinant assessment) we decided not to pool the data.

Table 1 Determinants of OA in ACL-injured patients

Determinant	Number of studies	Group A numbers	Group B numbers	Significant relation to OA: numbers (group A / group B)
Age	13	2	11	8 (2 / 6)
Gender	7	2	5	2 (2 / 0)
BMI	4	1	3	2 (0 / 2)
OA contralateral	1	0	1	1 (0 / 1)
Meniscus				
- injury	4	0	4	3 (0 / 3)
- resection	16	1	15	12 (0 / 12)
- amount resected	1	0	1	1 (0 / 1)
ACL reconstruction (yes-no)	4	0	4	1 (0 / 4)
Time injury-reconstruction	8	1	7	3 (0 / 3)
Graft type	4	1	3	2 (1 / 1)
Additional injuries	1	1	0	1 (1 / 0)
Chondral injuries	3	0	3	2 (0 / 2)
Joint stability	9	1	8	0
Strength	2	1	1	1 (0 / 1)
Type of sport post-injury	3	0	3	2 (0 / 2)

Group A: Prospective studies with study size ≥ 80
Group B: All designs or prospective studies with study size < 80

Table 1 shows an overview of determinants of OA in ACL-injured patients. We divided the included studies in two groups: A. prospective studies with minimally 80 patients and B. all other study designs or prospective studies with less than 80 patients. Age, meniscus (injury, resection and amount of resection), chondral injury and type of sport post-injury had a significant relationship with the development of OA in more than 60% of the studies which evaluated these determinants. No study (out of 9) showed a significant relationship between joint stability and development of OA. In the majority of these studies evaluating joint stability (7 out of 9), the population consisted of patients with an ACL reconstruction, in 2 studies patients were treated conservatively. Medial collateral ligament injury, limb axis and an isolated ACL injury versus combined injury were each evaluated in one study and showed no significant relationship with OA.
Conclusions: The risk of OA in patients with an ACL injury is increased in case of a combined meniscal or chondral injury and when patients had a high activity level after ACL injury.

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SERUM GLUCOSE IS ASSOCIATED WITH NEGATIVE EFFECTS ON KNEE STRUCTURE IN CLINICALLY HEALTHY ASYMPTOMATIC WOMEN

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Purpose: There is evidence to suggest that elevated glucose concentration and clinical diabetes are associated with osteoarthritis (OA). However whether this is a consequences of factors associated with symptomatic OA including obesity, reduced physical activity or medications is not known. To address this, we performed a longitudinal study to explore the relationship between serum glucose concentration and knee structure in a community-based asymptomatic population.
Methods: 185 subjects from the Melbourne Collaborative Cohort Study (MCCS) who had fasting glucose was available at baseline (1990) and who had undergone MRI of their dominant leg in 2003/4 and approximately 2 yrs later were recruited. No participant had diabetes at baseline. BMI was measured in 1990 and 2003. Cartilage volume and BMLs were determined from MRI using validated methods.
Results: At baseline, all subjects had serum glucose levels below diabetic range (<7 mmo). Three participants (2 women and 1 man) had physician diagnosed diabetes by second MRI 2006/7 and were excluded as fasting serum glucose is likely to vary in response to treatment. For women, baseline serum glucose concentration was negatively associated with total tibial cartilage volume (β −297.4 μl, 95% CI −576.9, −17.9; p = 0.04), independent of age and change in BMI. In contrast for men, a trend for a positive relationship was observed (β 456.6 μl, 95% CI −18.6, 931.1; p = 0.06). This sex difference was significant (p = 0.006 for interaction). Baseline serum glucose concentration was associated with increased annual loss of cartilage volume in women (β 49.1 μl, 95%CI 10.4, 87.9; p = 0.01) but not men (β 2.67, 95%CI −73.4, 78.8; p = 0.94). In women, increased glucose concentration was also associated with the incidence of BMLs over 2 years in knees free of BMLs (2003/4) (Odds Ratio 5.75, 95%CI 1.06–31.2; p = 0.04).

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OCCURRING PATTERNS OF OSTEOARTHRITIS ON THE ARTICULAR SURFACE OF THE MANDIBULAR CONDYLES

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Purpose: The aim of this study was to evaluate occurring patterns of osteoarthritic (OA) changes on the surfaces of the mandibular condyles and its relationship with clinical signs and symptoms in the patients with OA of the temporomandibular joint (TMJ).
Methods: The computed tomographic (CT) images and clinical records of 466 patients (86 males and 380 females whose mean ages were 30.5±15.6 and 33.6±16.1 years, respectively) who had been diagnosed by historical, clinical, and CT examination with TMJ OA without any systemic disease possibly related to joint diseases such as rheumatoid arthritis were retrospectively reviewed. To determine the occuring patterns of OA changes, the condylar surface was divided into three sections in the antero-posterior direction between the apex of the articular eminence and the squamotympanic fissure on the corrected sagittal views and three sections again in the medio-lateral direction between the